Patent Claims

1. A method for current measurement at a potential which is at a higher value than zero potential, the current value being measured in the form of an analog signal and its information being transmitted, after A/D conversion, in the form of a digital signal to an evaluation unit which is at ground potential, characterized in that the analog signal is subjected to compression before A/D conversion and transmission, and in that the digital signal is subjected to expansion after transmission at ground potential.

2. The method as claimed in claim 1, characterized in that compression and expansion are effected logarithmically.

3. The method as claimed in claim 1, characterized in that compression and expansion are effected on the basis of the stipulation of root functions.

4. The method as claimed in one of the preceding claims, characterized in that temperature compensation is effected.

5. The method as claimed in claim 4, characterized in that the measuring device and shunt are thermally coupled for the purpose of temperature compensation.

6. The method as claimed in one of the preceding claims, in which, in order to evaluate a measurement signal which, at a higher potential than zero potential, is in the form of an analog value in a measuring device that requires a supply current, having the following measures:

- the compressed information content of the measurement signal is transmitted, after A/D

conversion, in the form of a digital signal to the evaluation unit, which is at ground potential,

- after A/D conversion of the measurement signal, the digital signal produced provides the clock for modulating the supply current, with the result that the modulated supply current for the measuring device likewise performs the function of the carrier for the information content of the measurement signal.

7. A circuit arrangement for carrying out the method as claimed in claim 1 or one of claims 2 to 6, for use when measuring the current at a shunt, in which the voltage drop is evaluated as a measure of the current after amplification, said circuit arrangement having a shunt (1; 61, 61', 61''; 71), an amplifier (2) for the voltage signal that is tapped off at the shunt (1; 61, 61', 61''; 71), an analog/digital converter (3) and an evaluation unit (5, 65, 7) and also having means for supplying the measuring components (2, 3) with current, characterized in that further means (4, 6) for signal compression and signal expansion are provided.

8. The circuit arrangement as claimed in claim 7, characterized in that means for temperature compensation are additionally provided.

9. The circuit arrangement as claimed in claim 7, characterized in that a unit for signal compression is connected upstream of the A/D converter (3).

10. The circuit arrangement as claimed in claim 7, characterized in that the means for signal expansion are integrated in the evaluation unit (5, 65, 75), preferably in the existing microcontroller in the form of software.

11. The circuit arrangement as claimed in claim 8, characterized in that means for temperature compensation have a temperature-dependent reference voltage source (6).

12. The circuit arrangement as claimed in one of claims 7 to 11, characterized in that means (85, 95) for short-circuit disconnection and/or overload disconnection are provided.

13. The circuit arrangement as claimed in claim 12, characterized in that a first comparator (85), which compares the instantaneous value of the current with a first threshold value and produces a signal for short-circuit disconnection when said first threshold value is exceeded, is provided.

14. The circuit arrangement as claimed in claim 12, characterized in that a second comparator (95), which compares the instantaneous temperature of the load with a second threshold value and outputs a signal for overload disconnection when said second threshold value is exceeded, is provided.

15. The circuit arrangement as claimed in claim 14, characterized in that a thermal model (94) of the load is provided, said model being used to ascertain the instantaneous temperature of the load (80) from the current measured.